

1       1. In a digital receiver that is configured to receive a digital video signal  
2 representing a plurality of digital video packets and a digital audio signal representing a plurality  
3 of digital audio packets, a method of independently timing the presentation of the video  
4 information of the digital video packets with respect to the timing of the presentation of the  
5 audio information of the digital audio packets so that the video information and the audio  
6 information may be accurately timed even if they are from different unrelated programs, the  
7 method comprising the following:

- 8               an act of receiving a digital video signal and a digital audio signal;
- 9               an act of extracting a plurality of digital video packets from the digital video
- 10              signal;
- 11              an act of extracting a plurality of digital audio packets from the digital audio
- 12              signal;
- 13              an act of using a video clock to control the timing of the presentation of the
- 14              video information represented by the plurality of digital video packets; and
- 15              an act of using an audio clock to control the timing of the presentation of the
- 16              audio information represented by the plurality of digital audio packets, wherein the
- 17              audio clock operates separately and independently of the video clock.

18  
19       2. The method of independently timing the presentation of the video information of  
20 the digital video packets with respect to the timing of the presentation of the audio information  
21 of the digital audio packets as recited in Claim 1, further comprising the following:

- 22              an act of adding a local video time stamp to a digital video packet at a
- 23              substantially constant time period, packet to packet, after the receiver receives the digital

1 video packet; and

2 an act of comparing a program clock reference within the digital video packet to  
3 the local video time stamp.  
4

5 3. The method of independently timing the presentation of the video information of  
6 the digital video packets with respect to the timing of the presentation of the audio information  
7 of the digital audio packets as recited in Claim 2, wherein the act of using a video clock to  
8 control the timing of the presentation of the video information represented by the plurality of  
9 digital video packets comprises an act of controlling the speed of the video clock based on the  
10 comparison of the program clock reference to the local video time stamp.  
11

12 4. The method of independently timing the presentation of the video information of  
13 the digital video packets with respect to the timing of the presentation of the audio information  
14 of the digital audio packets as recited in Claim 3, further comprising the following:

15 an act of adding a local audio time stamp to a digital audio packet at a  
16 substantially constant time period, packet to packet, after the receiver receives the digital  
17 audio packet; and

18 an act of comparing a program clock reference within the digital audio packet to  
19 the local audio time stamp.  
20

21 5. The method of independently timing the presentation of the video information of  
22 the digital video packets with respect to the timing of the presentation of the audio information  
23 of the digital audio packets as recited in Claim 4, wherein the act of using an audio clock to

1 control the timing of the presentation of the audio information represented by the plurality of  
2 digital audio packets comprises an act of controlling the speed of the audio clock based on the  
3 comparison of the program clock reference to the local audio time stamp.

4  
5 6. The method of independently timing the presentation of the video information of  
6 the digital video packets with respect to the timing of the presentation of the audio information  
7 of the digital audio packets as recited in Claim 1, further comprising the following:

8 an act of adding a local audio time stamp to a digital audio packet at a  
9 substantially constant time period packet to packet after the receiver receives the digital  
10 audio packet; and

11 an act of comparing a program clock reference within the digital audio packet to  
12 the local audio time stamp.

13  
14 7. The method of independently timing the presentation of the video information of  
15 the digital video packets with respect to the timing of the presentation of the audio information  
16 of the digital audio packets as recited in Claim 6, wherein the act of using an audio clock to  
17 control the timing of the presentation of the audio information represented by the plurality of  
18 digital audio packets comprises an act of controlling the speed of the audio clock based on the  
19 comparison of the program clock reference to the local audio time stamp.

20  
21 8. The method of independently timing the presentation of the video information of  
22 the digital video packets with respect to the timing of the presentation of the audio information  
23 of the digital audio packets as recited in Claim 1, wherein the act of using a video clock to

1 control the timing of the presentation of the video information represented by the plurality of  
2 digital video packets comprises the following:

3 an act of comparing the local time at the digital receiver with a program clock  
4 reference within one of the digital video packets;

5 an act of slowing down the video clock if the comparison indicates that the  
6 presentation of the video information is ahead of schedule; and

7 an act of speeding up the video clock if the comparison indicates that the  
8 presentation of the video information is behind schedule.

9  
10 9. The method of independently timing the presentation of the video information of  
11 the digital video packets with respect to the timing of the presentation of the audio information  
12 of the digital audio packets as recited in Claim 8, wherein the act of using an audio clock to  
13 control the timing of the presentation of the audio information represented by the plurality of  
14 digital audio packets comprises the following:

15 an act of comparing the local time at the digital receiver with a program clock  
16 reference within one of the digital audio packets;

17 an act of slowing down the audio clock if the comparison indicates that the  
18 presentation of the audio information is ahead of schedule; and

19 an act of speeding up the audio clock if the comparison indicates that the  
20 presentation of the audio information is behind schedule.

21  
22 10. The method of independently timing the presentation of the video information of  
23 the digital video packets with respect to the timing of the presentation of the audio information



1 11. A computer program product for use in a digital receiver that is configured to  
2 receive a digital video signal representing a plurality of digital video packets and a digital audio  
3 signal representing a plurality of digital audio packets, a method of independently timing the  
4 presentation of the video information of the digital video packets with respect to the timing of  
5 the presentation of the audio information of the digital audio packets so that the video  
6 information and the audio information may be accurately timed even if they are from different  
7 unrelated programs, the computer-program product comprising a computer-readable medium  
8 having computer-executable instructions for performing the following:

9 an act of using a video clock to control the timing of the presentation of the  
10 video information; and

11 an act of, separately and independently of the video clock, using an audio clock  
12 to control the timing of the presentation of the audio information.

13  
14 12. The computer program product as recited in Claim 11, wherein the computer-  
15 executable instructions for performing the act of using a video clock to control the timing of the  
16 presentation of the video information comprises computer-executable instructions for  
17 performing the following:

18 an act of comparing the local time at the digital receiver with a program clock  
19 reference within one of the digital video packets;

20 an act of slowing down the video clock if the comparison indicates that the  
21 presentation of the video information is ahead of schedule;

22 an act of speeding up the video clock if the comparison indicates that the  
23 presentation of the video information is behind schedule.



1           15. In a digital receiver that is configured to receive a digital video signal  
2 representing a plurality of digital video packets and a digital audio signal representing a plurality  
3 of digital audio packets, a method of independently timing the presentation of the video  
4 information of the digital video packets with respect to the timing of the presentation of the  
5 audio information of the digital audio packets so that the video information and the audio  
6 information may be accurately timed even if they are from different unrelated programs, the  
7 method comprising the following:

8                     an act of receiving a digital video signal and a digital audio signal;

9                     an act of extracting a plurality of digital video packets from the digital video  
10                    signal;

11                    an act of extracting a plurality of digital audio packets from the digital audio  
12                    signal; and

13                    a step for independently controlling a video clock that controls the timing of the  
14                    video presentation speed of the plurality of digital video packets, and an audio clock that  
15                    controls the timing of the audio presentation speed of the plurality of digital audio  
16                    packets.

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18           16. The method of independently timing the presentation of the video information of  
19 the digital video packets with respect to the timing of the presentation of the audio information  
20 of the digital audio packets as recited in Claim 15, wherein the step for independently  
21 controlling a video clock and an audio clock comprises the following:

22                    an act of using a video clock to control the timing of the presentation of the  
23                    video information represented by the plurality of digital video packets; and



1 an act of using an audio clock to control the timing of the presentation of the  
2 audio information represented by the plurality of digital audio packets, wherein the  
3 audio clock operates separately and independently of the video clock.  
4

5 17. The method of independently timing the presentation of the video information of  
6 the digital video packets with respect to the timing of the presentation of the audio information  
7 of the digital audio packets as recited in Claim 16, wherein the act of using a video clock to  
8 control the timing of the presentation of the video information represented by the plurality of  
9 digital video packets comprises the following:

10 an act of comparing the local time at the digital receiver with a program clock  
11 reference within one of the digital video packets;

12 an act of slowing down the video clock if the comparison indicates that the  
13 presentation of the video information is ahead of schedule; and

14 an act of speeding up the video clock if the comparison indicates that the  
15 presentation of the video information is behind schedule.  
16

17 18. The method of independently timing the presentation of the video information of  
18 the digital video packets with respect to the timing of the presentation of the audio information  
19 of the digital audio packets as recited in Claim 17, wherein the act of using an audio clock to  
20 control the timing of the presentation of the audio information represented by the plurality of  
21 digital audio packets comprises the following:

22 an act of comparing the local time at the digital receiver with a program clock  
23 reference within one of the digital audio packets;

1 an act of slowing down the audio clock if the comparison indicates that the  
2 presentation of the audio information is ahead of schedule; and

3 an act of speeding up the audio clock if the comparison indicates that the  
4 presentation of the audio information is behind schedule.

5  
6 19. The method of independently timing the presentation of the video information of  
7 the digital video packets with respect to the timing of the presentation of the audio information  
8 of the digital audio packets as recited in Claim 15, wherein the act of using a video clock to  
9 control the timing of the presentation of the video information represented by the plurality of  
10 digital video packets comprises the following:

11 an act of comparing the local time at the digital receiver with a program clock  
12 reference within one of the digital video packets;

13 an act of slowing down the video clock if the comparison indicates that the  
14 presentation of the video information is ahead of schedule; and

15 an act of speeding up the video clock if the comparison indicates that the  
16 presentation of the video information is behind schedule.